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THE LOCALISATION OF FEELING¹

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Störing,² in 1905, basing his conclusion upon the reports of 3 subjects and also upon objective records, distinguished between *Empfindungslust* and *Stimmungslust*. His method was the following: "während man bei der Erzeugung von Lust, die an eine Geschmacksempfindung geknüpft ist, die Geschmackslösung während der Dauer des Versuchs im Munde behalten lässt, gab ich zum Zweck der Erzeugung von Stimmungslust der Vp. die Anweisung, die Lösung zu schlucken und dann von der Empfindung abzusehen, mit dem Schlucken den Geschmacksreiz als eine erledigte Tatsache zu betrachten." After a little practice, the subjects were able to carry out the instruction, and agree "dass an der unter den neuen Bedingungen entstandenen Lust die gesamten jeweilig vorhandenen Bewusstseinsinhalte teilhaben, während die unter den gewöhnlichen Bedingungen entstandene Lust an die Geschmacksempfindungen allein gebunden erscheint, die Geschmacksempfindungen zusammen mit der Lust sich als geson-

¹ From the Psychological Laboratory of Cornell University.

² Störing, G., Experimentelle Beiträge zur Lehre vom Gefühl, *Arch. f. d. ges. Psychol.*, 6, 1905, 316-32.

dert von den übrigen Bewusstseinsinhalten darstellen" Rose³ in 1913, accepting Störing's distinction, defines "Stimmungslust als solche Lust, die das Gesamtbewusstsein okkupiert, und Empfindungslust als solche Lust, die eng gebunden ist an einen Empfindungskomplex." *Empfindungslust* is localisable: "Die Unlust ist ganz im Munde lokalisiert" (Vp. Btz.); "Vp. N. gibt an, dass sich die Unlust direkt und ausschliesslich an die Zunge knüpft." *Stimmungslust* is not localisable.

With *Empfindungslust* mixed feeling (coexistence of pleasantness and unpleasantness) is possible whether or not pleasantness (P) and unpleasantness (U) are antagonistic, for P and U may exist side by side as red and green in the same visual field. With *Stimmungslust*, however, mixed feeling is a question of the antagonism of P and U.

The experimenters recording mixed feeling also note that P and U may be localised. Nakashima⁴ remarks that "a few cases of affective localisation occurred in the experiments by the method of single stimuli." Koch⁵ states: "in unseren Versuchen finden wir, sobald die Versuchspersonen nur einige Übung in der Selbstbeobachtung erlangt haben, zahlreiche Fälle von Zuständen der Lust und Unlust, die deutlich lokalisiert werden." Wohlgemuth⁶ notes that "*the feeling-tone is mostly localisable*. With tactile, pain, olfactory and gustatory sensations this is almost invariably the case with subjects R and F. Subjects P and J are unable to localise the feeling-tone at the beginning of the investigation, but as the training proceeds statements to that effect, become more frequent." Finally in our own investigation⁷ of mixed feeling, localisation occurred in the reports of several subjects.

The following study of affective localisation is based upon the results of a previous study of mixed feeling, to which the reader is referred for method, divisions of the experiment, stimuli, and other details.

³ Rose, H., Der Einfluss der Unlustgefühle auf den motorischen Effekt der Willenshandlungen, *Arch. f. d. ges. Psychol.*, 28, 1913, 109-10.

⁴ Nakashima, T., Contributions to the Study of the Affective Processes, *Am. Jour. of Psychol.*, 20, 1909, 184.

⁵ Koch, B., Experimentelle Untersuchungen über die Mannigfaltigkeit der elementaren Gefühlsqualitäten, *Halle Diss.*, 1911, 90.

⁶ Wohlgemuth, A., On the Feelings and their Neural Correlate, with an Examination of the Nature of Pain, *Brit. Jour. of Psychol.*, 8, 1917, 450.

⁷ Young, P. T., An Experimental Study of Mixed Feelings, *Am. Jour. of Psychol.*, 29, 1918, 237 ff.

I. QUANTITATIVE RESULTS

Percentage of Localised Feelings. Table I shows the number and percentage of reports containing localised feeling. Three reports (F, 2; G, 1) are ambiguous, and 1 (G) is doubtful. If we eliminate these equivocal reports, there remain 72, or 3.2%, localised feelings, reported by three subjects (H, F, K). Six of 9 subjects report no unequivocal localised feelings.

TABLE I
PERCENTAGE OF LOCALISED FEELINGS

Subject	B	Da	Di	F	G	H	K	O	W	Total
Number reports.....	193	275	242	252	232	242	307	278	191	2,212
Reports containing loc. feeling.....	0	0	0	19	2	51	4	0	0	76
Percentage.....	0	0	0	7.5	.8	21.0	1.3	0	0	3.4

Distribution of Localised Feelings. Table II shows the number of localised feelings reported on successive days of the experiment.⁸ It will be seen that localised feelings occur in sporadic groups. Note the large group of H, days 4-9, and F, days 10-14. Note also the groups, extending for two consecutive days, of G, days 2-3, and K days 23-24. Apart from these well-defined groups, localised feelings are reported at random on single days.

Relation of Localised Feelings to Mixed Feelings.

The relation of localised feeling to mixed feeling is shown quantitatively by several facts. In the first place, the same subjects report both: unequivocal mixed feeling is reported⁹ by F (4), H (4), K (21), O (2); unequivocal localised feeling is reported by F (17), H (51), K (4). In the second place, the distribution of localised feelings and mixed feelings is of the same type: both occur in sporadic groups throughout the course of the experiment and throughout the single experimental hour. In the third place, the groups of localised feelings and mixed feelings overlap; both occur on the same days. Table IV shows the coincidences.

In the fourth place, the percentages of mixed feelings and localised feelings are almost identical, although the overlapping is only partial. There are 3.2% mixed feelings¹⁰ and 3.4% localised feelings in the experiment as a whole.

⁸ For the total number of reports on these days see *ibid.*, 246.

⁹ *Ibid.*, 244.

¹⁰ *Ibid.*, 244.

TABLE II
DISTRIBUTION OF LOCALISED FEELINGS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
F	0	0	0	2	0	0	0	0	0	2	7	3	2	3	0	0	0	0	0					
G	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
H	0	3	0	1	4	2	21	16	1	0	0	0	0	0	0	0	0	0						
K	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1

Within the single experimental hour localised feelings tend to occur in groups of consecutive reports. Table III illustrates this tendency.

TABLE III
DISTRIBUTION OF LOCALISED FEELINGS WITHIN THE SINGLE EXPERIMENTAL HOUR

Subject	Day	Number reports	Reports containing localised feeling
F	10	16	152, 153
	11	14	165, 166, 167-172, 173-175, 176
	14	10	205, 206, 207
H	7	25	76, 77, 78, 79-81-83, 84, 85, 86, 87, 88, 89, 90, 91-94, 95, 96, 97, 98, 99, 100
	8	26	101, 102-104, 105-107-110, 111-113-115-117-119, 120, 121-123, 124-126

TABLE IV
COINCIDENCES OF MIXED FEELINGS AND LOCALISED FEELINGS

Subject	F		H			K	
Day.....	11	13	2	5	6	23	24
Number of localised feelings.....	7	2	3	4	2	2	1
Number of mixed feelings.....	3	1	3	4	1	5	2

Of the 71 mixed feelings reported, 9 contain explicit localisation¹¹ of the coexisting feelings (H, 4; K, 3; F, 1; G, 1). Nineteen others seem to imply a localisation by the statement that the object-feeling is "attended to," is in the focus or background of consciousness, etc. The remaining 43 contain no statement regarding localisation. However, all of the "mixed feelings" are of an objective type of report, characterised by reference of P-U to an object and identification of P-U with an object; so possibly in some cases localisation is taken for granted and not reported. The feelings may be localised in the following mixed-feeling reports, for example, although there is no specific mention of *place where* as regards P and U.

"You have the U from one field and the P from the other" (H 16). "Slightly P from the body and a more intense U from the sandpaper; seemingly two disparate things" (H 18). "It seemed that the sweetness of the odor and its piquancy were there at the same time—P and U" (O 135). "It is difficult to say whether just the odor was there or whether a P odor was there" (O 140). "The bitter and the sweet were there side by side and I think the feelings were there" (W 50).

We conclude (1) that the subjects show marked individual differences in the tendency to report localised feelings, (2) that localised feelings are reported sporadically in groups throughout the course of the experiment and throughout the course of the single experimental hour, and (3) that there is a very close quantitative relation between mixed feelings and localised feelings.

II. ANALYTICAL

Qualitative Differences of Feeling. Some of the subjects, especially G, report qualitative differentiation of Ps and Us.¹² Following are examples:

¹¹ *Ibid.*, 260. Seven of these reports are printed in full.

¹² By a mere chance the qualitative differences recorded are between Ps; there are very few qualitative differentiations of Us in our protocols.

"The tactual sensations were P in quality and exciting. I had a different quality of P . . . a comfortable feeling" (G 41). "The first was a much livelier P than the other; it seemed closely connected with the bodily attitude of attending and it hung over while the other P that I would call comfort came in" (G 121). "At first an agreeable P and then a lively P with an amusing aspect" (G 150). "At first a very lively P with strong organics of even intensity. . . . Then the P started again; this time much quieter than before. It was made up partly of enjoyment and partly of relief" (G 154). "The first P was satisfying. Then the quality of the P changed with the coming of the second experience; I got quite strong exciting P with amusement. Then I seemed to get a shift between the quiet sort of P and the exciting. Sometimes the quiet P was in the focus and the other in the background, and then the tables were turned and the other P came to the focus with the quiet, comfortable P in the background" (G 157). "A feeling of well-being. Then another P which had a different quality; it was a soothed feeling. Then some of the first P came again and the other dropped out." (F 197). "A big shift in feeling. A strong suggestion of two qualitatively different Ps, but I'm not sure" (B 143). "Both experiences were P: one was a tickling P and the other was a soothing P. You seem to get the body divided; all down the central core and on my left side I could feel the smooth, swaying rhythm of the movement. Whereas, at the right of the head and shoulder there was this P tickling feeling like quick vibrations running all over you" (H 73).

Subject F reports qualitative differences of a different order between object-feelings. "Feeling" is equivalent to "what the object suggests," "what it is like," "how it makes one feel," "what it makes one want to do," etc. "Feeling," again, is sometimes described in sensory terms. There is thus a double confusion (1) between meaning and feeling, and (2) between sensation and feeling. In the following examples compare the stimulus with the "feeling" it evokes:

(Water on face) "U, a cold feeling, a feeling of being disturbed" (F 76). (Bite of banana) "P, a soft, velvety, cold feeling; it was much as if someone had put something into your hand that was soft and velvety and cold" (F 89). (Asafoetida) "U, an irritated feeling. You feel as you feel when you are peeling an onion" (F 90). (Fife) "That's the feeling that makes your teeth go together. It makes you shrink and sends shivers up and down your back. It makes you feel gritty all over; you feel like jumping up and stopping it" (F 92). (Hot brass on cheek) "That's U. It makes cold chills go up your back. It feels burny, hot and inflamed" (F 94). (Quinine) "U, a drawn-up feeling as if you were being squeezed; a withered feeling. You feel as if the corners of your mouth were drawn down" (F 97). (Peppermint candy) "Very P. It makes you feel soothed, soft and velvety. It makes you feel very happy, elated, expansive, as if you had won a victory" (F 98). (c, e, g, c'.) "The same feeling as listening to a harp" (F 99). (Rattle) "That's U, a chaotic feeling" (F 103). (Odor coffee) "This is P. I felt as if I were taking coffee; a smoky feeling in the throat" (F 122). (Odor turpentine) "This is P. I feel as I feel when I walk through a newly-painted house. A spicy, refreshing feeling" (F 123). (Sight of dead rabbit) "A sym-

pathetic U. It makes you feel the way you feel when you see a dead cat" (F 126). (Nitrobenzole odor) "This is P, a spicy, peppery feeling" (F 133). (Pressure cotton) "A soft, soothing feeling" (F 140). (Sarsaparilla, stale cheese). "At first a sweet, sickish feeling and then a disgusting organic feeling" (F 155).

Types of Localisation. There are four types of localisation, which are described below.

1. P and U may be localised at the place of the stimulus-object. Following are examples:

(Taste of salt solution) "U, a drawn-up feeling . . . localised in the mouth" (F 152). (Odors: cinnamon *plus* asafoetida) "It is as if one were in each nostril. On the left I got P and on the right I got U" (F 166). (Chord c, e, g, c') "P seemed in the center of my head" (F 175). (Pinch nose with clothes pin) "U localised in my nose. An explosive feeling as if you were stopped up and going to explode" (F 176). (Shrill fife) "The U was localised inside my head between the ears" (F 178). (Rap on forehead) "A pain U was localised in the head" (F 185). (Sharp nail on cheek) "A U localised on the cheek" (F 197). (Taste solution alum) "A drawn-up feeling localised in the mouth" (F 205). (Sandpaper teeth) "Then U localised in my teeth, an annoying feeling" (F 207). (Shrill fife) "U. The experience seemed to be in the head; the feeling was localised in the head; the U was in the ears" (H 78). (Asafoetida) "U, purely in the nose and throat" (H 81). (Bite of banana) "The P was part in the stomach and part in the mouth" (H 83). (Sandpaper forehead) "Mostly felt—in the sense of affection—at the point of contact. Some feeling seemed to come from between the shoulders" (H 87). (Peppermint candy) "P; a mild feeling pretty much limited to the mouth" (H 98). (Odor vanilla) "Mild P, confined pretty much to the head and throat" (H 107). (Burn hot brass) "Purely a pain U, localised distinctly at the point of contact" (H 115). (Sandpaper arm, perfume) "U on my hand and P with my nose" (K 12). (Velvet on one cheek, sharp nail on other) "The feelings were localised in the cheeks" (K 312).

2. P and U may be localised organically, remote from the stimulus-object. Following are examples:

(Perfume, H₂S) "P localised along the spinal cord" (H 23). (Torture, perfume) "The perfume was very, very P and it was as if you felt it in the center of your body right up through the viscera. The U seemed to be confined more to the outside muscles—the skeletal muscles" (H 58). (Torture, perfume) "The P was a weak central core in the middle of me. The P did not extend below the thorax. The U was all over the body, even to the feet, only it didn't get inside of me" (H 60). (Imaginary stink, perfume) "I had a kinaesthetic experience then as if I were being rilled apart; it was U. It was well down in the abdomen whereas the P was felt in the upper part of the chest" (H 67). (Metronome, largo 42) "An irritating U; the feeling was in the legs and arms" (H 79). (Anise odor) "P, very mild and soothing, in the middle part of the body. The periphery of the body does not seem to be involved but rather the central part" (H 96). (Odor stale cheese) "Quite strongly U. The feeling experience seemed to localise above the stomach" (H 113). (Peppermint candy)

"P, mild but soothing. It was confined to the column in the center of the body" (H 126). (Picture mural decoration) "The pleased aspect was localised peripherally" (H 235).

3. P and U may spread out or radiate from a given center so that they pervade the body. P and U may also move up and down the trunk or across the body. Following are examples of irradiating and moving feelings:

"One of those Ps that I feel through the entire trunk of the body. It begins at the bottom of the body and works up" (H 7). "A slightly nauseating U particularly in the stomach. It spread itself out to most of the body" (H 84). "It is all up and down the main part of the body. It doesn't affect the arms much but it does extend to the legs" (H 85). "A mild, soothing P from the lower abdomen up—not including the arms, however. It was stronger towards the top of the body and seemed to fade away at the lower part" (H 88). "A moderately strong feeling of U. It was felt more particularly through the chest. Most of those feelings go up and down but that feeling ran through from right to left" (H 89). "A sickening, nauseating U. It was localised more particularly in the stomach but was felt all over the body, somewhat in the lower limbs" (H 91). "P confined to the head. A tendency for the feelings to go down the body" (H 101). "The U experience is localised more particularly at the base of the spine. A jerky thing that runs out through you seems to be the U" (H 104). "P localised in the chest, in the upper part of the trunk. It had a radiating attribute" (H 105). "The U seems to center pretty low in the body near the base of the spine" (H 117). "The feeling experience is quite bodily with its focus at the ear" (H 119). "Moderately U; up and down the spine" (H 121). "At first the U was merely in the mouth but quickly it passed to the body. The feeling seemed to pervade the body" (H 123). "U; it became more generally diffuse throughout the body" (H 128).

4. P and U may be wide-spread over the whole body, diffuse, general. Following are examples:

"U, the whole body revolted; I felt it all over" (H 56). "An ephemeral sort of P. You feel it all over you . . . the P doesn't seem to attach to anything; you are immersed in it" (H 63). "Quite P, a pervasive feeling-tone. It pretty much fills the whole experience" (H 77). "U, a general feeling of withdrawal, pretty much over the whole body" (H 99). "The U increased and was pretty much all over the body. It was as low as the knees" (H 100). "U . . . it seemed wide-spread" (H 111). "U. I feel that all over; the whole body was involved. It was not general at first but just local" (H 124).

All of the localised feelings of F, G, and K are of the first type. The illustrations of types 2, 3, and 4 are taken entirely from the reports of a single subject (H).

Characterisation of Object-feeling. The object-feeling may now be characterised by (1) a form of report¹³ that refers P-U to an object or identifies P-U with an object, (2) qualita-

¹³ Young, *op. cit.*, 253, 259.

tive differentiations, sometimes described in sensory terms and sometimes as meanings, (3) localisability, (4) compatibility of P and U object-feelings, and (5) the fact that the object-feeling may be attended to,¹⁴ or in the background or focus of consciousness.

Localisation is thus one characteristic of the object-feeling. Object-feelings are *localisable* but not always *localised*.

III. DISCUSSION

Dependence of Qualitative Differences of Feeling Upon Sensory Components. Qualitative differentiations between object-feelings depend upon sensory elements, especially organic and kinaesthetic, which are part of the total "feeling" experience. This dependence is shown in the following:

"I am sure there was a difference in sense-feeling. I found it difficult to separate feeling from sensory component, and I got the impression that there was a quality-difference between the two Ps. The first was soft and voluminous, the second was biting and pungent" (W 124). "The U was more like a pain sensation than like a U feeling. The pain is U, but it doesn't set up the kinaesthesia that usually accompanies intense U" (H 49). "It seems that the organic sensation is the P localised" (H 148). "The P changed somewhat in character; it appears to be organic" (H 155). "There was soothing P. The soothing is kinaesthetic and organic. The kinaesthesia is around the throat and diaphragm" (O 202). "The amusement hang-over seemed kinaesthetic and not feeling. I believe I have before reported the kinaesthesia of amusement as a P feeling" (K 230). "It seems as if I could correlate degree of feeling with degree of something down in the abdomen" (B 182). "P with a stimulating quality in it. I think I could analyse the stimulating quality into bodily things. What it amounts to is that I am suddenly more conscious of the upper part of the body" (G 98). "The U seemed brighter and had more body to it because (I think) I got kinaesthesia in the neck and forehead and pressure about my nostrils" (G 99). "The U seemed brighter because of the bodily context it had" (G 103). "At first I got just cold moving contact, very U, and kinaesthesia in my throat. The U seemed more attached to the sensory components whereas the P had become a more independent state. It was connected more with a widespread bodily complex; it had become more nearly bodily comfort than P" (G 57). "First P in the sense of being satisfied; the bodily counterpart of satisfaction was in the thorax. Then an intense U with a being-disturbed aspect; being-disturbed was being caught in taking a breath, a strong tension in my throat" (G 137.)

So far as our results go, qualitative differentiations of Ps and Us depend upon the sensory elements in a total feeling experience. As to the number and *order* of the elemental affective qualities (abstracted from sensory components and meaning), we await further experimental results.

¹⁴ *Ibid.*, 260.

Dependence of Localisation of Feeling upon Sensory Components. That localisation of feeling depends upon localised sensory components, especially organic and kinaesthetic, may be clearly demonstrated in the case of H. During the first 6 days of the experiment H reported 10 cases of localised feeling (Table II). On day 7 the first 3 reports contained localised feeling, after which O was instructed "to watch and report Ps and Us that have a place or locality." Possibly this instruction acted as a suggestion; for, of the remaining 22 reports given on this day, 18 contained localised feeling! On the following day, having reported 4 localised feelings (the last in the chest region), H was asked: "When you speak of 'feeling' do you mean muscular and organic sensation?" H replied " . . . The P actually seems to come from the chest region; it seems to be there." [Two days later, however, he reported: "It seems that the organic sensation is the P localised" (148).] On this day (day 8) 16 localised feelings were reported out of 26 reports. On the next day (day 9), the second report given was of localised feeling, after which H was instructed "to abstract from organic sensation and report feeling." The instruction was almost immediately carried out, for the change in type of report is very marked. The remaining 16 reports on this day contain not a trace of localised feeling. And throughout the rest of the experiment (except on day 17; see Table II) there is no more localisation of feeling. Just as soon as organic sensation was abstracted, and feeling reported for its own sake, localisation disappeared.¹⁵

With F, localised feeling disappeared (day 15) just as abruptly as with H. The disappearance, however, occurred on the first day that picture stimuli¹⁶ were used. F's feelings had been localised exclusively at the place of the stimulus-object, and when pictures were substituted for odors, tones, tastes, pain, etc., the feelings ceased to be localised. But, quite apart from this sudden change of stimuli, the reports of the latter section are psychological;¹⁷ feeling is reported

¹⁵ H's mixed feelings disappeared after day 6; his localised feelings did not disappear until day 9. The explanation of this disparity is probably that the conditions were not favorable for mixed feeling on days 7, 8, and 9, since the work on these days was with a single stimulus. H's mixed feelings are mainly of the localised object-feeling type.

¹⁶ Picture stimuli seem to be unfavorable to localisation of feeling. Relatively few localised feelings are to be found in the protocols of Kellogg (see Young, *op. cit.*, 259, note 37). Kellogg used visual stimuli exclusively.

¹⁷ Young, *op. cit.*, 252.

for its own sake with no reference to object; no localisation is to be found in this section.

CONCLUSIONS

Störriing's distinction between *Empfindungslust* and *Stimmungslust* thus appears to be a distinction between the unanalysed object-feeling of common-sense, and the psychological report of affection (abstracted from other elements). *Stimmungslust* was obtained by instructing the subjects to abstract from the taste. When P and U are regarded independently, there are no localisation and mixture, for localisation and mixture depend upon the sensory object.

We conclude:

(1) P and U are not localisable. Localisation and extent are characteristics of the unanalysed object-feeling of common-sense.

(2) Localisation and also qualitative differences of feeling depend upon sensory components in the total feeling experience. The popular term "feeling" includes localised sensation as well as meaning.

(3) Localised feelings are reported rarely; six of nine subjects report no unequivocal localisation of feeling. Localised feelings occur in groups sporadically throughout the course of the experiment and in consecutive reports throughout the single experimental hour. The quantitative results show a close relation between localised feelings and mixed feelings.